

CDF Trigger Data Base

Complete overview

Alexei Varganov, Stephen Miller,
Dante Amidei , Myron Campbell

University of Michigan

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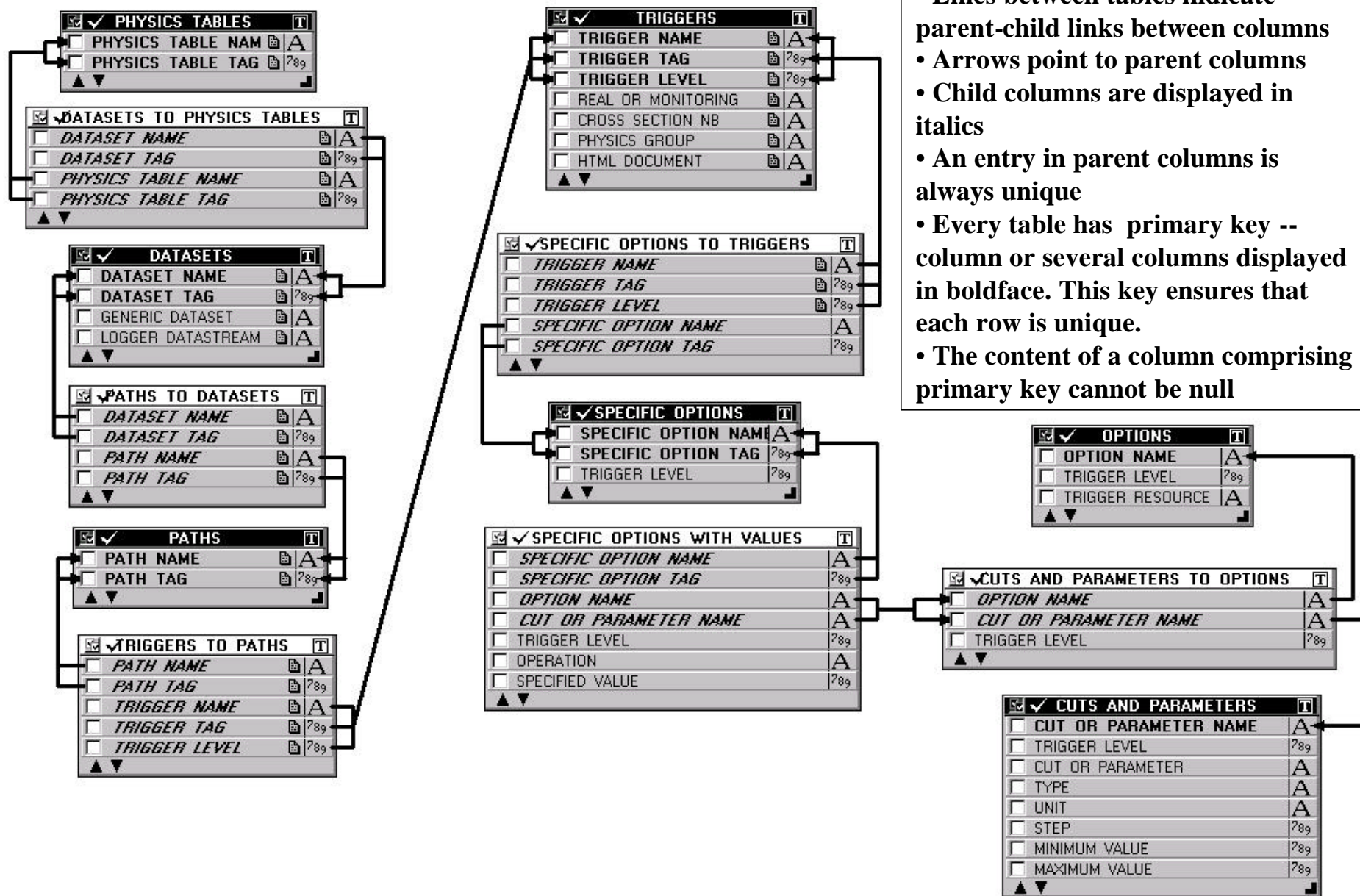
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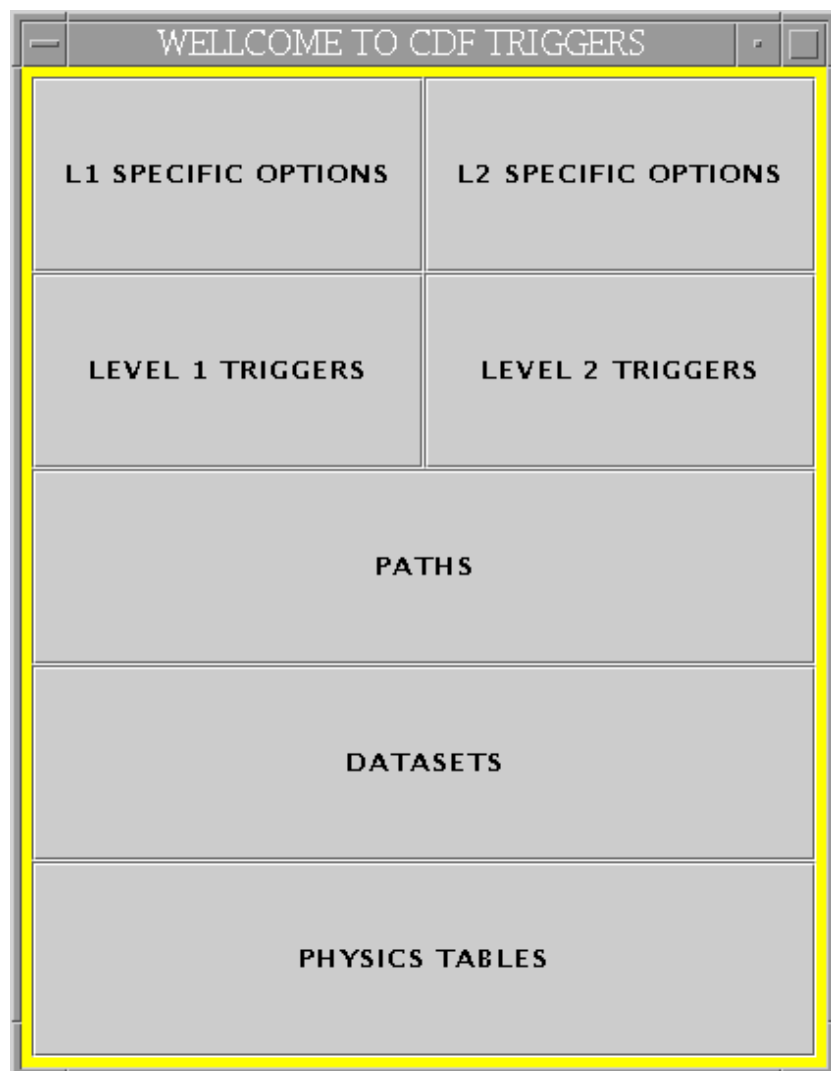
Trigger Objects

- ***PHYSICS_TABLE*** – the highest level trigger object, which completely defines the trigger system configuration for a run. Technically *PHYSICS_TABLES* is a group of *DATASETS*.
- ***DATASET*** – a specific trigger object, which describes the group of related *TRIGGER_PATHS* and assigns them to an appropriate data stream through Level 3 and data handling system.
- ***TRIGGER_PATH*** – a combination of one Level 1 *TRIGGER*, one Level 2 *TRIGGER*, and one Level 3 *TRIGGER*.
- ***TRIGGER*** – a collection of *SPECIFIC_OPTIONS* at the specified trigger level
- ***SPECIFIC_OPTION*** – an instance of an *OPTION* where all *PARAMETERS* are specified with values.
- ***OPTION*** – a collection of *PARAMETERS* and/or *CUTS* related to a trigger hardware unit. *OPTIONS* along with *CUTS* and *PARAMETERS* represent the lowest level trigger objects

Overall Trigger Data Base outline



Creating a Trigger Table



- Trigger DB GUI is a special tool designed to create trigger tables.
- The detailed instructions are on the web www-cdf.fnal.gov/internal/createatrigger.html
- Using the main panel, it's possible to browse, edit and create a new trigger objects.
- One can chose any starting point in creating a trigger table reusing existing low level trigger objects.
- The process of making a new trigger table with only Level 1 – 2 specifications in it does not require any manual validation procedures

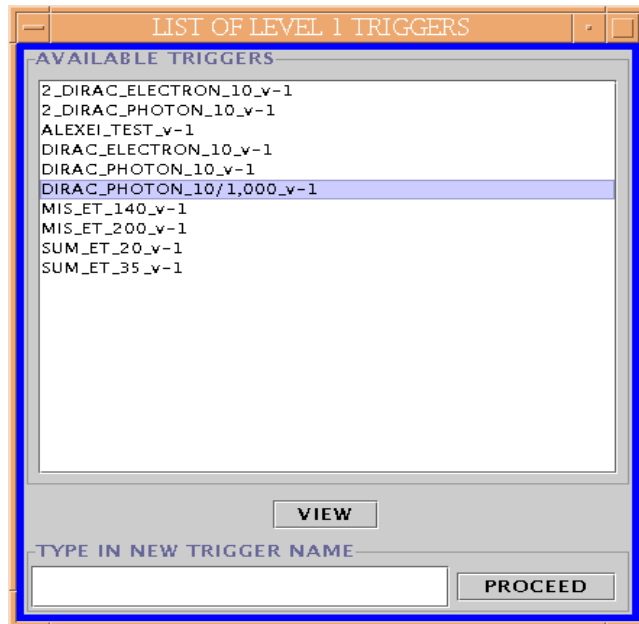
Creating a Trigger Table (cont'd)

List of different parameters can be viewed and edited for a specific option

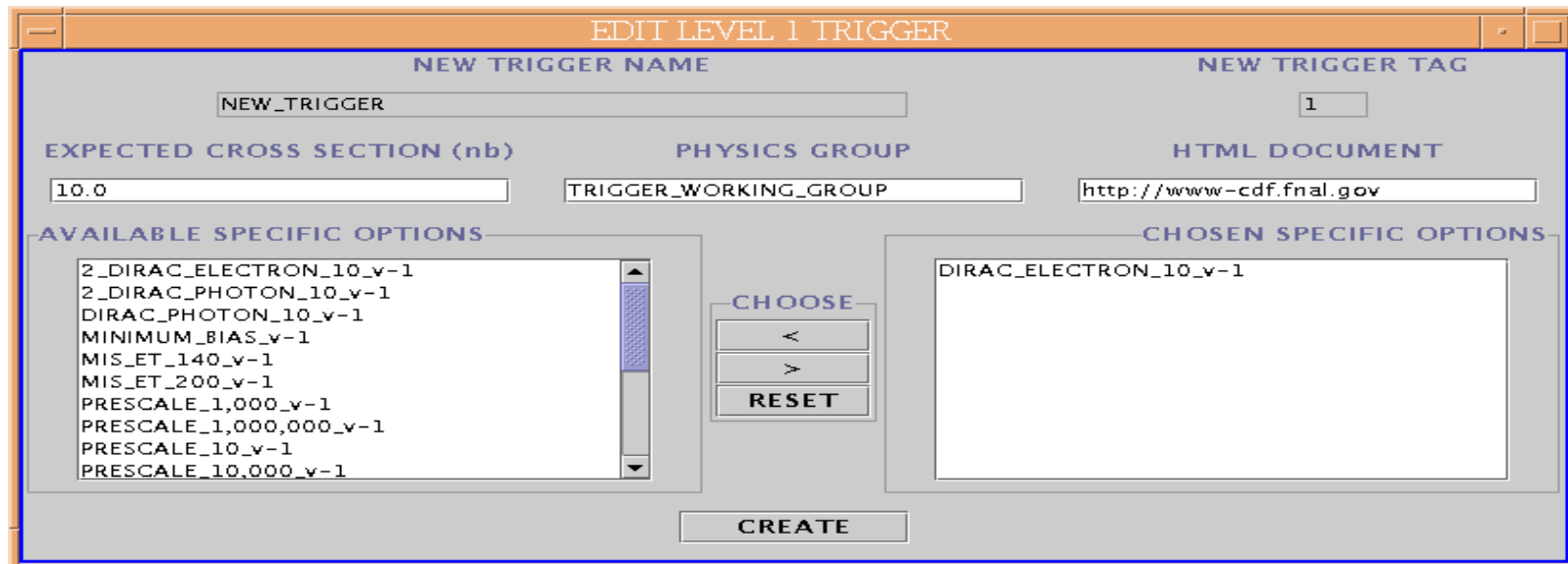
The screenshot shows a software window titled "EDIT SPECIFIC OPTION". At the top, there are two input fields: "NEW SPECIFIC OPTION NAME" with the value "DIRAC_ELECTRON_10" and "NEW TAG" with the value "2". Below these is a table with four columns: "CUT OR PARAMETER NAME", "OPERATION", "VALUE", and "UNIT". The table contains 12 rows of parameters. At the bottom of the window are two buttons: "RESET" and "CREATE".

CUT OR PARAMETER NAME	OPERATION	VALUE	UNIT
DIRAC_EM_ET_CENTRAL	>=	10.0	GeV
DIRAC_EM_ET_PLUG	>=	10.0	GeV
DIRAC_HAD_EM_RATIO_CENTRAL	<=	0.02	real
DIRAC_HAD_EM_RATIO_PLUG	<=	0.02	real
DIRAC_HAD_EM_SEL_CENTRAL	=	0.25	GeV
DIRAC_HAD_EM_SEL_PLUG	=	0.25	GeV
DIRAC_NO_OF_DRIVEN_BITS	=	1.0	integer
DIRAC_TOW_GRAN_CENTRAL	=	0.5	GeV
DIRAC_TOW_GRAN_PLUG	=	0.5	GeV
DIRAC_TRACK_NO_LAYERS	=	4.0	integer
DIRAC_TRACK_PT	>=	5.0	GeV/c
DIRAC_TRACK_SIGN	=	-1.0	integer

Creating a Trigger Table (cont'd)



- List of different trigger objects can be viewed through the “LIST” panel
- Detailed information about chosen trigger objects can be viewed through the “VIEW” panel
- New trigger objects can be created through the “EDIT” panel



WHAT HAPPENS WHEN NEW TRIGGER TABLE IS BEING COMMITTED

- Consistency check for all Level 1 – 2 hardware is performed
 - Crate sum bit assignment according to “DIRAC rules” (CDFNOTE 4225)
 - Uniqueness of global trigger parameters such as DIRAC_GRANULRAITY, MUON_THRESHOLDS etc
- All Level 1 hardware configuration data is generated:
 - Track and single tower memory patterns for DIRAC
 - PreFred bits for DIRAC, MUON (CDFNOTE 5424), SUM ET, CLC
 - Routing memory patterns and bits for FRED
- The following actions are performed for Level 2:
 - Header files are generated for level 2 code and transmitted to alpha station
 - A new level 2 code is compiled with the new header files
 - New level 2 executables are built and put into access area
- Level 1-2 comprehensive trigger report web page is generated
http://www-b0.fnal.gov:8000/trigger_reports/

WHAT HAPPENS WHEN RUN CONTROL REQUESTS A TRIGGER TABLE

- To facilitate interface between Run Control and Trigger Data Base a special java package TriggerDB was developed, which includes
 - Oracle connection control classes
 - Table access utilities
 - Trigger configuration downloading
- This product is stored in online CVS repository and includes 8 separate sub packages with many lines of java code.
- When a trigger table is used by Run Control to start a new run the following actions happen:
 - All the trigger systems, specified in Trigger Table get parameters from the Data Base
 - In case if the Trigger Table is simple and some trigger units are not specified in the table, they get default configuration parameters and/or they are masked with 0 pre scale factors

TRIGGER DATA BASE ACCESS TOOLS

- Trigger DB GUI can be used for browsing different trigger info
- Data Base browser by Randolph Herber
<http://cdfdbb.fnal.gov:8520/cdfr2/databases>
 - Use CDFONPRD instance of the Data Base
 - “Triggers and Filters” feature
 - When used in general table browsing mode, COMMON and DOWNLOADS views are often useful to browse
- Special TriggerDB offline package was written for use in AC++ framework
 - Visit CDF offline code browser to look into details
 - There is a test program in TriggerDB/Test/test.cc which shows how to use the package. To get the executable check out TriggerDB and ‘gmake tbin’.
 - Can be used in many Trigger Monitors, such as Xmon, TrigMon, TrigSim, Carla’s job